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F1T TC T102 T129 T133 T141 T312

(56) Documents Cited

GB 1013351 A US 5408824 A

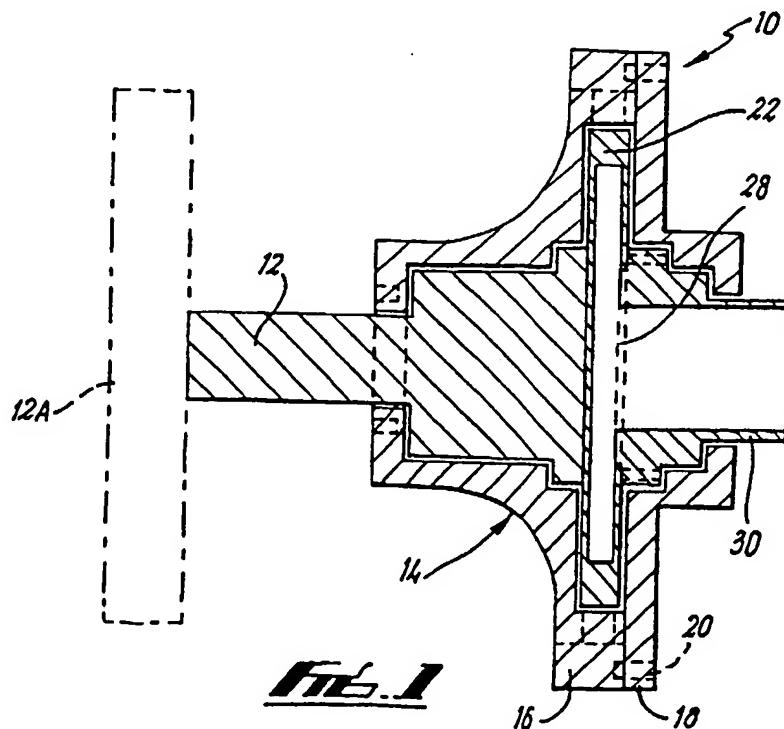
(58) Field of Search

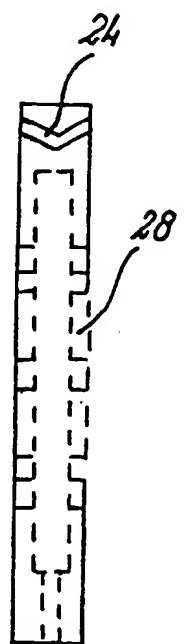
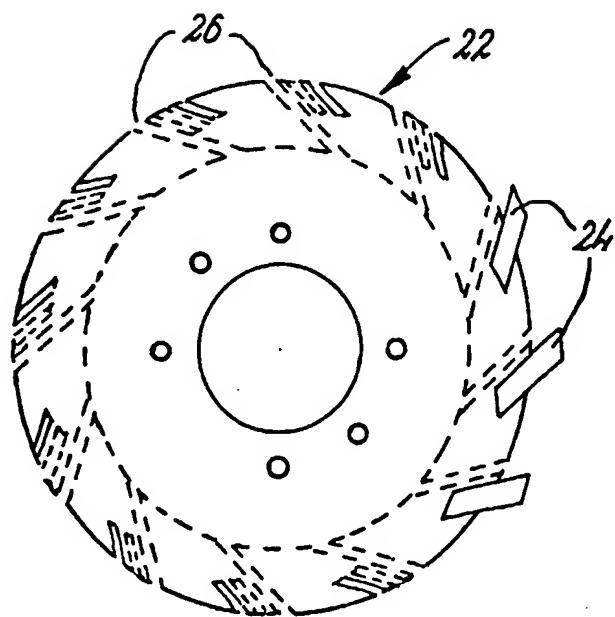
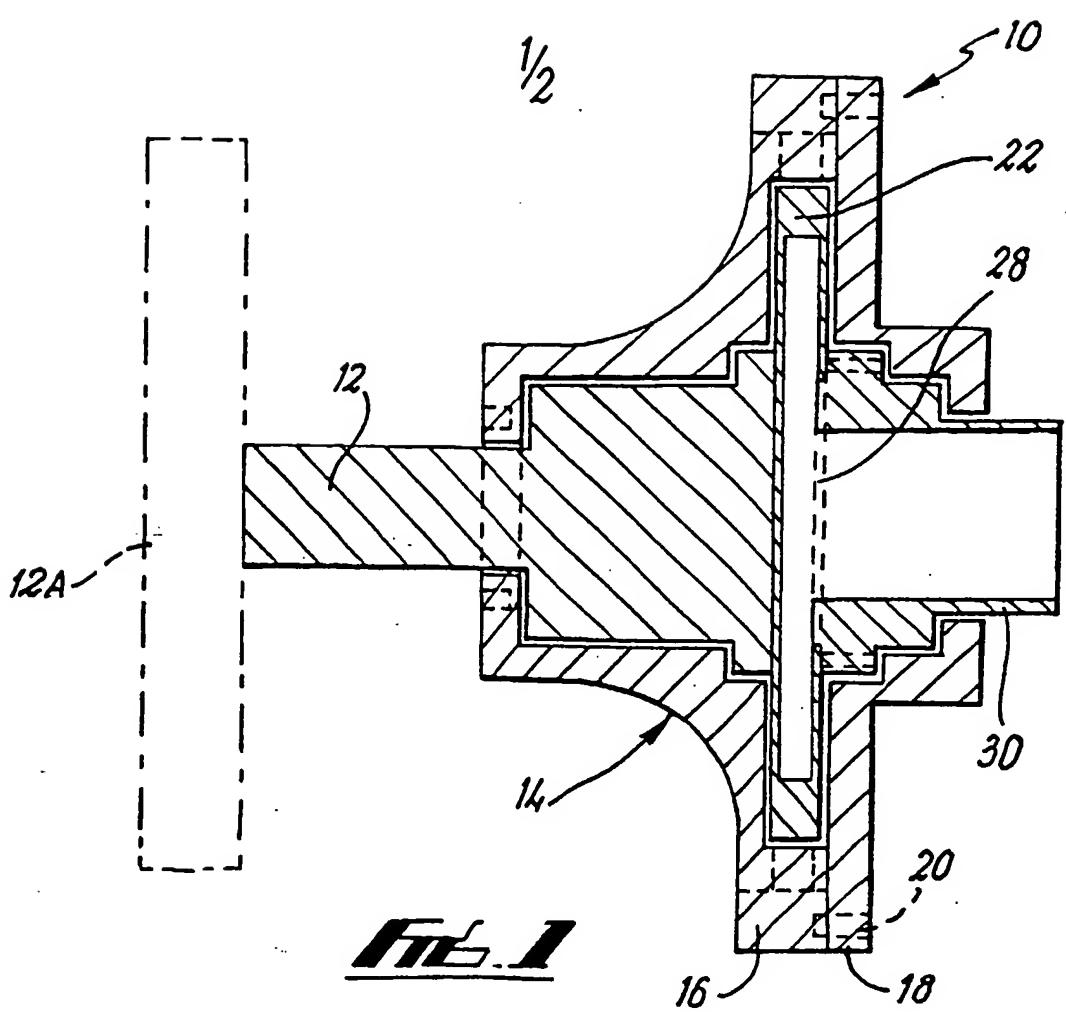
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(54) Abstract Title

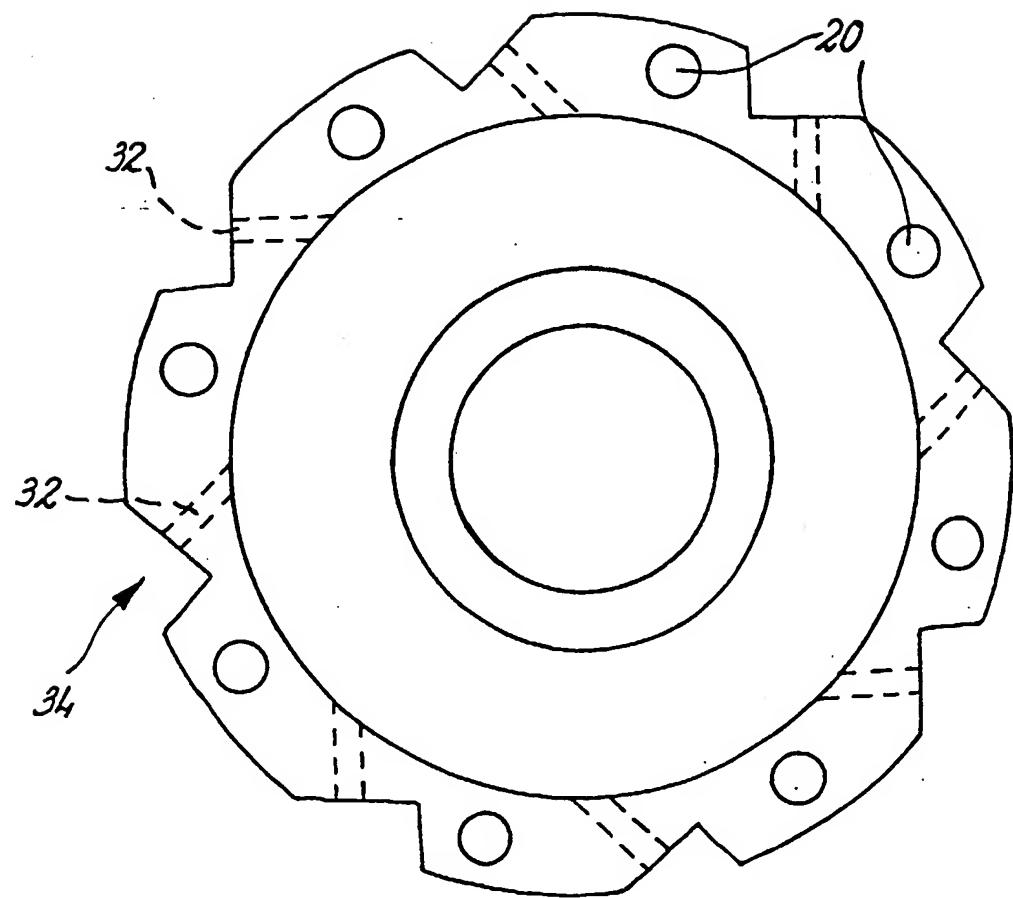
Fluid Driven Rotary Device

(57) A hollow member 22, rotatably mounted within a two-part housing 14, receives fluid via an intake tube 30, the fluid being conducted within the rotor to plurality of outlets (26, fig. 2) around the circumference of the member 22, each outlet having an inclined (relative to the radial direction) deflector (24, fig. 2) adjacent thereto. The housing is provided with a plurality of passages around its periphery the passages being connected to a fluid supply at a pressure lower than that connected to the intake tube 30, whereby fluid is drawn through the member 22, to cause it to rotate. A flywheel 12A may be provided.





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Improvements in or relating to Rotary Motion Providing Apparatus

This invention relates to apparatus for providing rotary motion.

In many situations such as the inlet manifold leading from the carburettor of an internal combustion engine to the cylinders, areas of low pressure are created and the potential energy in such areas is often not utilised.

According to the present invention there is provided apparatus for providing rotary motion from a fluid supply at a first pressure, the apparatus comprising a plurality of spaced connection means from said supply each leading to a point on the circumference of a substantially cylindrical housing, a hollow member coaxially rotatably mounted within the housing, a plurality of outlets around the circumference of the member leading to the hollow centre, and a plurality of deflectors inclined relative to the radial direction, each extending away from one of the outlets, the hollow member mounting radial drive means and connecting with a fluid supply at a second pressure, the second pressure being higher than the first pressure whereby fluid is drawn through the member and out of the outlets into the connection means with the deflectors causing the hollow air passes through the outlets.

The hollow member may be substantially cylindrical.

Preferably there are the same number of outlets as connecting means and both are substantially equispaced from one another.

Preferably the hollow member and deflectors together provide a sliding fit within the housing.

The hollow member preferably connects with the atmosphere.

The outlets may be inclined relative to the radial direction and may lie

parallel to the deflectors. Twelve outlets may be provided.

The deflectors desirably have a chevron shaped section.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig. 1 is a diagrammatic sectional side view of apparatus according to the invention;

Fig. 2 is a diagrammatic plan view of a component of the apparatus of Fig. 1;

Fig. 3 is a diagrammatic part sectioned end view of the component shown in Fig. 2; and

Fig. 4 is a diagrammatic plan view of a further component of the apparatus of Fig. 1.

The drawings show apparatus 10 suitable for providing rotary motion, in the form of a rotating shaft 12, from a supply of below ambient pressure fluid.

The apparatus 10 comprises a two part housing 14. The two parts 16, 18 of the housing are fastened together by bolts 20 to define a central cylindrical chamber with a greater radius than length. The parts 16, 18 are shaped to each define three coaxial shoulders leading away from the central chamber in each direction, each shoulder having a progressively smaller radius to define a plurality of contiguous cylindrical chambers.

A hollow disc 22 (best illustrated in Figs 2 and 3) is coaxially rotatably mounted within the central cylindrical chamber. A plurality of deflectors 24, (only three of which are shown in Fig 2 for and one in fig 3) are mounted substantially equispaced around the circumference of the disc 22. The deflectors 24 are in the form of a length of angle iron inclined substantially at 45° to the tangential direction, with the angle pointing radially inwardly. The disc 22 together with the deflector 24 provide a sliding fit within the central

chamber.

A plurality of outlets 26 are provided around the circumference of the disc 22, each corresponding to one of the deflectors 24. Each outlet 26 is located immediately adjacent the inwardly angled side of one of the deflectors 24, and the outlets are aligned substantially parallel to the respective deflectors 22.

A substantially central opening 28 is provided on one side of the disc 22. A contoured intake tube 30 is mounted around the opening 28. The tube 30 is shaped to provide a sliding fit within the housing 14 and against the respective shoulders, and to extend from the housing 14.

The shaft 12 is mounted coaxially on the other side of the disc 22. The shaft 12 is shaped to slidably fit within the housing 14 and against the respective shoulders, and to extend from the other side of the housing 14. Mounting means such as a coaxial screw thread may be provided on the shaft 12 for connection to an object to be driven (not shown). A flywheel represented schematically by the dashed lines 12A in Fig. 1 is fixedly mounted on the shaft 12 and connected by a belt (not shown) to the object to be driven.

A plurality of passages 32 are provided through the walls of the housing 14 corresponding to the central chamber. A passage 32 is provided for each outlet 26. The passages 32 are aligned to be substantially parallel to the outlets 26 when respective ends of each are adjacent each other.

Notches 34 are formed in the housing 14 around the opening of each passage 32. The notches 34 present a planar surface around the opening perpendicular to the passage 32. Pipework (not shown) can be connected at the notches 34 by any suitable means to the passages 23.

In use, the pipework connected to the passages 23 is connected to a supply of fluid at below ambient pressure. FIGURE

pressure gradient between the supply of fluid and the atmosphere, through the passages 23 from inside the disc 22 via the fluid being sucked into the disc

through the tube 30. The inclination of the openings 26 in the shape and the deflectors 24 causes the disc 22 to rotate as fluid is being sucked therethrough, relative to the housing 14.

There is thus described a mechanically relatively simple apparatus for producing rotary motion from a supply of fluid at below ambient pressure. A result of this simplicity is that the device can be inexpensively manufactured and can also run substantially maintenance free. Obviously if required, suitable bearings (not shown in the drawings) could be provided in the housing.

The above described example is intended for use in providing extra rotary motion in a car engine from the area of low pressure formed in the inlet manifold. However this apparatus and modifications of it can be used in many other situations. For example the apparatus could be used in a wind tunnel or in a refrigeration unit.

Various modifications may be made without departing from the scope of the invention. For example a different number of openings in the disc could be provided. The deflectors could be otherwise shaped. The above example uses air, but a wide range of fluids including both gases and liquids can be used. The housing could take a different form and have a different shape.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

outlets lie parallel to the deflectors.

8. Apparatus for providing rotary motion according to any of the preceding claims, wherein twelve outlets are provided.

9. Apparatus for providing rotary motion according to any of the preceding claims, wherein the deflectors have a chevron shaped section.

10. Apparatus for providing rotary motion according to any of claims 2 to 9, wherein the deflectors are provided on the circumference of the hollow member.

11. Apparatus for providing rotary motion according to any of claims 2 to 10, wherein the direction of flow of fluid at the second pressure is coaxial with the hollow member.

12. Apparatus for providing rotary motion according to claim 11, wherein the direction of flow of fluid at the second pressure is generally perpendicular to the direction of flow of fluid at the first pressure.

13. Apparatus for providing rotary motion according to any of the preceding claims, wherein the radial drive means is drivably connected to a rotatable member.

14. Apparatus for providing rotary motion according to claim 13, wherein the rotatable member is drivingly engageable with a driven member.

15. Apparatus for providing rotary motion according to claim 13 or 14, wherein the rotatable member comprises a flywheel.

16. Apparatus for providing rotary motion according to any of the preceding claims, wherein the radial drive means is a shaft.

17. Apparatus for providing rotary motion substantially as herein described with reference to the accompanying drawings.
18. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.



Application No: GB 0014538.3  
Claims searched: 1-17

Examiner: C.B.VOSPER  
Date of search: 19 February 2001

## Patents Act 1977

### Search Report under Section 17

#### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): F1T(TC)

Int Cl (Ed.7): F01D 1/00,1/06,1/22,1/32,1/34

Other: EPOQUE:EPODOC,JAPIO,WPI

#### Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 1013351	WESTWIND (figs. 1 and 2, noting connection means 19, and deflectors 8)	1,2,5-7, 10,11,13, 14,16 at least
X	US 5408824	SCHLOTE (drawings, noting connection means 134,136, and deflectors 26; col. 8, lines 1-42)	1,2,7,11,13, 14,16 at least

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|---|---|---|--|
| X | Document indicating lack of novelty or inventive step   | A | Document indicating technological background and/or state of the art.  |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention.          |
| & | Member of the same patent family  | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |